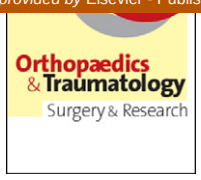
Orthopaedics & Traumatology: Surgery & Research (2012) 98, 608—612

Available online at
SciVerse ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en



CASE REPORT

A ganglion cyst generated by non-absorbable meniscal repair suture material

H.J. Kang[a], C.H. Chun[a,*], S.H. Kim[a], K.M. Kim[b]

[a] *Department of Orthopedic Surgery, School of Medicine, Wonkwang University Hospital, 344-2 Shinyong-dong, Iksan, Chunbuk, Republic of Korea*
[b] *Department of Nursing, Chodang University, Muan-Gun, Chonnam, Republic of Korea*

Accepted: 19 December 2011

KEYWORDS
Meniscal repair;
Ganglion cyst;
Non-absorbable suture

Summary Arthroscopic meniscal repair has been a common procedure for the treatment of a torn meniscus, since the importance of meniscal preservation is widely understood. Over the years, the complications associated with suture material have been reported. Meniscal cyst is also one of those things. But ganglion cyst triggered by non-absorbable suture material was not documented in the literature. We report the case of a 19-year-old boy who underwent arthroscopic ACL reconstruction and repair of the medial meniscus by inside-out technique using 2-0 non-absorbable polyester sutures. The patient returned to our clinic at 4-year F/U with right knee pain due to medial meniscus tear and ganglion cyst. We suspect non-absorbable suture materials itself might have caused soft tissue irritation with repetitive trauma that lead to mucoid degeneration which results in ganglion cyst formation in the end.

Introduction

Arthroscopic meniscal repair becomes a common procedure, because the importance of meniscal preservation is widely understood. Arthroscopic meniscal repair has evolved in recent years from inside-out and outside-in techniques to the all-inside meniscal repair. Over the years, many complications have been reported, including saphenous neuropathy, chondral injuries, aseptic synovitis and implant breakage [1,2].

Lately, meniscal cysts after meniscal repair have been reported by several authors and the cause was discussed [3—9]. However a ganglion cyst after meniscal repair was not documented in the literature. Meniscal cysts are invariably associated with horizontal meniscal tears [10,11]. Most authors believe that they are formed by extrusion of joint fluid through a meniscal tear into the adjacent tissues [10.11]. Ganglion cysts may resemble meniscal cysts in that they present as a mass containing jellylike viscous fluid similar to the material found within meniscal cysts. But their formation is not related to meniscal tear itself [10].

We report a case of a ganglion cyst around knee joint after inside-out repair using 2-0 non-absorbable polyester sutures.

* Corresponding author. Tel.: +82 063 859 1363; fax: +82 063 852 9329.
E-mail address: cch@wonkwang.ac.kr (C.H. Chun).

1877-0568/$ - see front matter © 2012 Elsevier Masson SAS. All rights reserved.
doi:10.1016/j.otsr.2011.12.006

Clinical case

A 19-year-old boy visited our clinic because of right knee pain, which persists for 2 weeks after twisting knee injury while playing baseball. Physical examination showed swelling of knee joint and medial joint line tenderness. The range of motion was restricted from 5° to 110°. The Lachman test, anterior drawer test and McMurray test were positive. Radiographic studies were normal. A magnetic resonance imaging (MRI) showed discontinuity of anterior cruciate ligament (ACL) and combined horizontal and vertical traumatic tear of medial meniscus (Fig. 1). The patient underwent the arthroscopic ACL reconstruction using a Fresh-frozen Achilles allograft and repair of the medial meniscus by inside-out technique using 2-0 non-absorbable polyester suture (five sutures) via routine three-portals (Fig. 2). Postoperatively, the knee was placed in a hinged brace that was locked in full extension for 2 weeks. Only touch-down weight bearing with crutches was permitted. A partial weight bearing was permitted at 6 weeks postoperatively, and full weight bearing at 8 weeks. A second-look arthroscopic examination performed after 2 years postoperatively revealed a good synovial coverage of the reconstructed ACL graft and completely healed medial meniscus without degeneration (Fig. 3). Also, abnormal physical examinations were not observed including palpable mass.

The patient returned to the clinic at 4 year F/U with right knee pain of 1-week duration after minor twisting knee injury while walking. Manual knee laxity tests were negative. McMurray test was positive. A painless subcutaneous mass was observed over the medial joint line of the right knee and he said mass was palpable a few month ago. The mass was 2×1 cm well-defined, firm, immobile and non-tender along the medial joint line under the previous incision scar of meniscal repair. A MRI of the right

Figure 1 A, B. MRI showed combined horizontal and vertical traumatic tear of medial meniscus. C. Sagittal MRI showed complete rupture of ACL at the femoral attachment site.

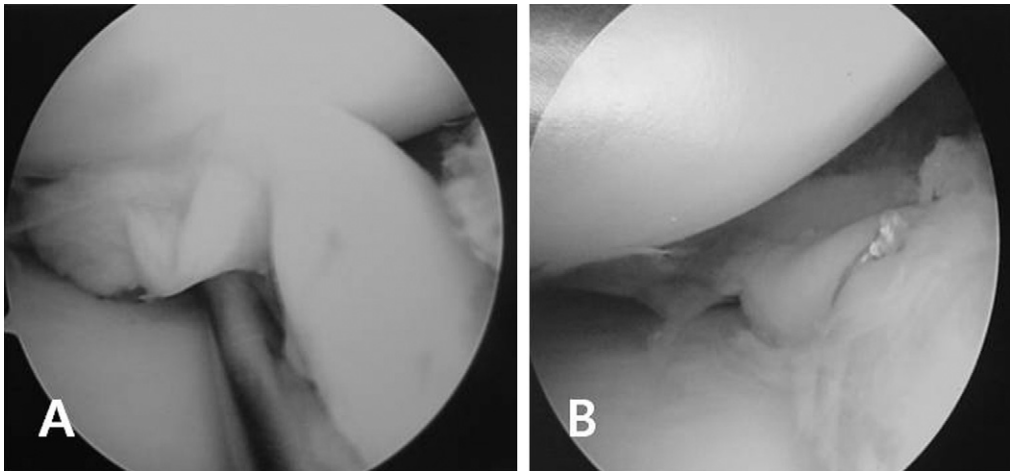


Figure 2 A. The arthroscopic view of the combined horizontal and vertical tear of medial meniscus. B. Inside-out sutures were performed arthroscopically.

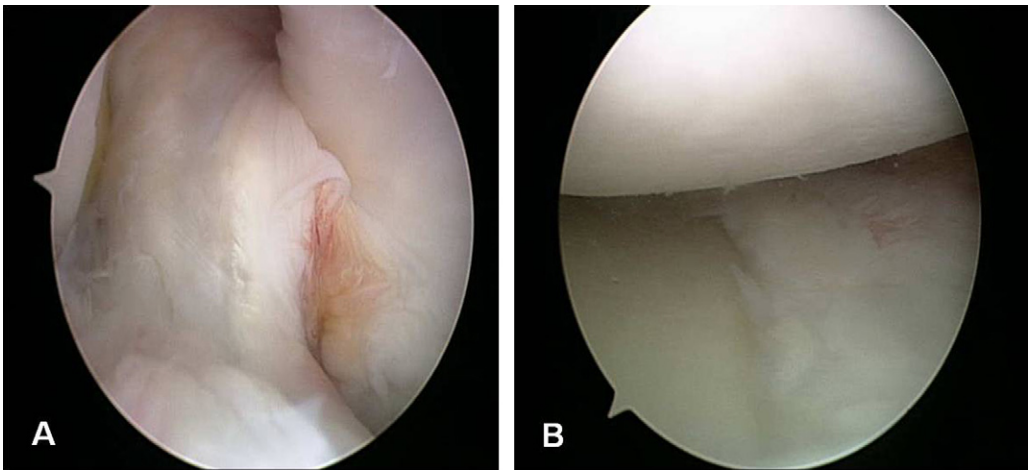


Figure 3 Second look arthroscopic examination showed complete healing of medial meniscus and revascularization of meniscal rim at 2 years after surgery.

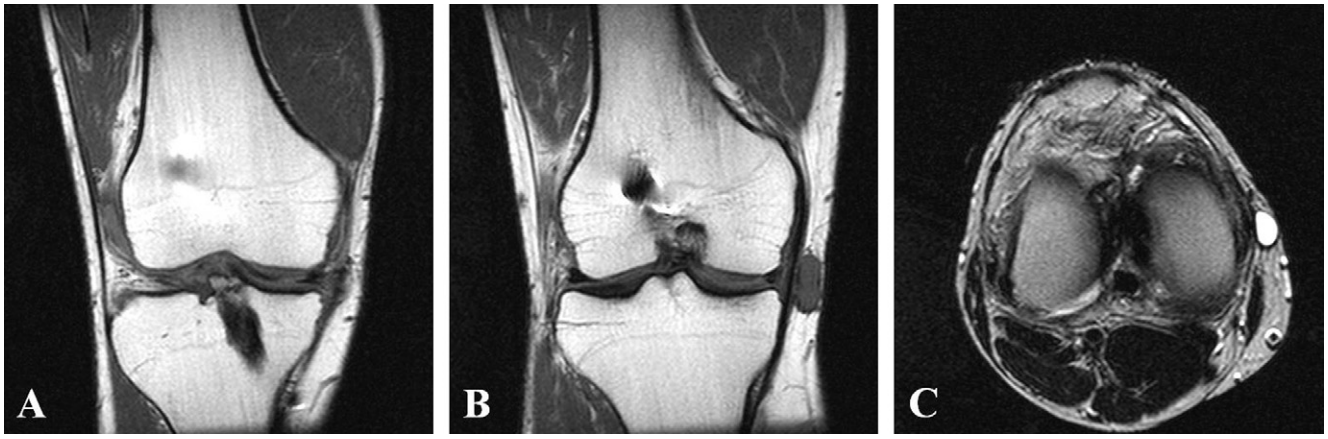


Figure 4 A. Coronal MRI showed bucket handle tear of MM. (B) Coronal and (C) axial MRI showed a ganglion cyst located just superficial to medial collateral ligament at the medial joint l.

knee showed thinning of ACL graft, bucket-handle tear of medial meniscus and ganglion cyst. It had a low signal intensity on T1-weighted images and a high signal intensity on T2-weighted images. It was located just superficial to medial collateral ligament at the medial joint line without apparent intra-articular communication (Fig. 4). On arthroscopy, we identified a partial tear of ACL graft and bucket-handle tear of medial meniscus. We performed arthroscopic partial debridement of ACL graft and subtotal menisectomy of medial meniscus because it was irreparable. Any evidence of cyst communication with joint was not observed. A skin incision was carried out over the cyst and dissected down to its base at the level of the medial collateral ligament. We revealed multilobulated mass containing viscous and colorless fluid. Non-absorbable suture materials was embedded at the bottom of the mass (Fig. 5). A cyst communication with joint was not found grossly. In histological examination, the mass contained myxoid degeneration and cystic wall with fibrous tissue and foreign body-type giant cells contained suture materials. There was no specific lining epithelium or synovial cells (Fig. 6).

Figure 5 Multilobulated mass contained a myxoid material and non-absorbable sutures were embedded at the bottom of the mass.

Table 1 Literature review. Cyst after meniscal repair.

	Suture technique	Suture material	Meniscal problems	Treatment	Histological exam
Choi et al. [3]	Inside-out	Non-absorbable	Intact meniscus on MRI	Cystectomy	Not mentioned
Kimura et al. [4]	Inside-out	Non-absorbable		Cystectomy	Synovial cyst
Lombardo et al. [5]	All-inside	Non-absorbable		Cystectomy	Synovial cyst
Nagura et al. [6]	Inside-out	Non-absorbable		Cystectomy	Meniscal cyst
Nakamae et al. [7]	All-inside Outside-in	Non-absorbable		Cystectomy	Synovial cyst
Tingstad et al. [8]	All-inside	Bioabsorbable	Not mentioned	Aspiration	Not performed
Yoo et al. [9]	All-inside Inside-out	Bioabsorbable		Cystectomy	Not performed

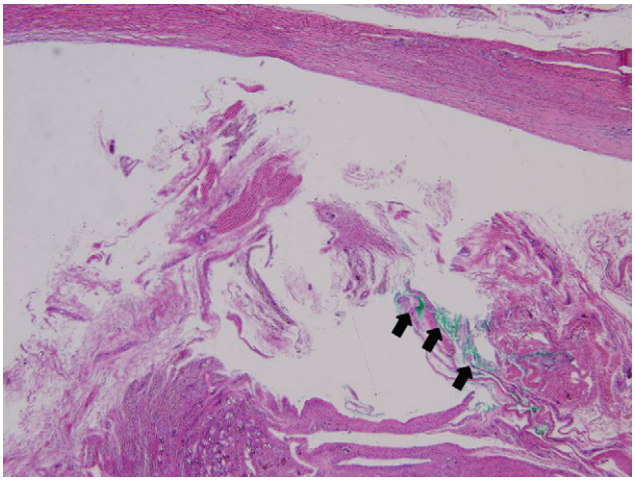


Figure 6 Histologic examination of the mass showed cystic wall with fibrous tissue and foreign body-type giant cells containing suture materials. There was no specific lining epithelium (black arrows) (H&E stain × 40).

Discussion

We reviewed reported cyst formation after meniscal repair. To date, there are seven published cases of cyst formation after meniscal repair (Table 1) [3—9]. Durations of meniscal cyst formation were various from 12 weeks to 6 years. Histological exam was not performed in three cases [3,8,9] and other three cases were confirmed as synovial cyst that contained synovial lining cell [4,5,7]. Only one case did not contain synovial lining cell [6].

The natural pathogenesis of ganglion cyst and meniscal cyst was not proven. We cannot be sure that cyst is whether meniscal cyst caused by meniscal tear or ganglion cyst caused by cystic degeneration after meniscal healing. However, we placed more weight on ganglion cyst rather than meniscal cyst based on three facts. First, histological examination showed myxoid degeneration and foreign body-type giant cells containing suture materials. Second, patient stated mass was palpable a few months before the second injury. Finally, we had confirmed completely healed medial meniscus without degeneration at a second-look arthroscopy and we could not found abnormal physical examinations including palpable mass at that time.

With these facts, we think that cyst did not formed by extrusion of joint fluid through a meniscal tear into the adjacent tissues but by soft tissue irritation with repetitive trauma by non-absorbable suture materials that lead to mucoid degeneration which resulted in ganglion cyst formation in the end.

We should remember that meniscal cyst and ganglion cyst can occur as a complication of meniscal repair. Lastly we recommend to remove cysts as well as suture materials if decided to perform surgery.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References

[1] Austin KS. Complications of arthroscopic meniscal repair. Clin Sports Med 1996;15:613—9.
[2] Calder SJ, Myers PT. Broken arrow: a complication of meniscal repair. Arthroscopy 1999;15:651—2.
[3] Choi NH, Kim SJ. Meniscal cyst formation after inside-out meniscal repair. Arthroscopy 2004;20:1—3.
[4] Kimura M, Hagiwara A, Hasegawa A. Cyst of the medial meniscus after arthroscopic meniscal repair. Am J Sports Med 1993;21:755—7.
[5] Lombardo S, Eberly V. Meniscal cyst formation after all-inside meniscal repair. Am J Sports Med 1999;27:666—7.
[6] Nagura I, Yagi M, Kokubu T, Yoshiya S, Kurosaka M. Generation of meniscal cyst after arthroscopic meniscal repair. Arthroscopy 2004;20:869—71.
[7] Nakamae A, Deie M, Yasumoto M, Kobayashi K, Ochi M. Synovial cyst formation resulting from nonabsorbable meniscal repair devices for meniscal repair. Arthroscopy 2004;20:16—9.

[8] Tingstad EM, Teitz CC, Simonian PT. Complications associated with the use of meniscal arrows. Am J Sports Med 2001;29:96—8.
[9] Yoo JH, Yoon JR, Lee SJ. Parameniscal cyst formation after arthroscopic meniscal repair with biodegradable meniscal arrow: a case report. Knee Surg Sports Traumatol Arthrosc 2008;16:815—7.
[10] Burk Jr DL, Dalinka MK, Kanal E, Schiebler ML, Cohen EK, Prorok RJ, et al. Meniscal and ganglion cysts of the knee: MR evaluation. Am J Roentgenol 1988;150: 331—6.
[11] Steiner E, Steinbach LS, Schnarkowski P, Tirman PF, Genant HK. Ganglia and cysts around joints. Radiol Clin North Am 1996;34:395—425.